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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106
MILPITAS, CA 95035

EXAMINER

DANG, KHANH

ART UNIT PAPER NUMBER

2111

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,700

Applicant(s)

HICKERSON ET AL.

Examiner

Khanh Dang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: in the "Background of the Invention," the word "HBAnywhere" should be changed to – HBAniware --. Emulex's HBAnywhere incorporates driver-based technology to enable complete management of Emulex HBAs, including the ability to upgrade firmware anywhere in a Fibre Channel or iSCSI SAN from a single console..

Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 16 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 16, the "multibus" lacks antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 10-14, 18, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Heil et al. (Heil, 6,173,374).

As broadly drafted, these claims do not define any structure or step that differs from Heil.

As broadly drafted, these claims do not define any structure or step that differs from Heil.

With regard to claim 10, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example), wherein the local host bus adapter is capable of managing the remote host bus adapter through a bus interface (in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122. In particular, local host bus adapter 117 can be initialized as a directory manager to request and receive peer HBAs directory information (see flow chart of Fig. 4C and description thereof) or to demand directory information from peer HBAs (see flow chart of Fig. 4C and description thereof)).

With regard to claim 11, it is clear that the switching and routing means of Heil includes a Fibre Channel link (Fiber Channel Backbone 121).

With regard to claim 12, the message request (I/O request in Heil, for example) is received by the local host bus adapter 117 from software of the local host 100 via PCI bus interface provided by Host to PCI Bus Bridge 115 connected to PCI Bus 116.5.

With regard to claim 13, it is clear that the local host bus adapter 117 includes a local bus interface message software driver and local bus interface message hardware and firmware (in Heil, each HBA 117, 126 contains managing means which includes the "Distributed block I/O redirector driver software" 240, 331, the I/O shipping ISM 270, 340 and the I/O shipping HDM 280, 350. The I/O redirector software 240, 331 provides the means to allow the HBA 117, 126 to make the decision whether to satisfy a block I/O request locally or remotely. The I/O redirector 240, 331 has the means to search a directory which stores the location of local and remote blocks within the cluster's drives. The directory is stored within HBA cache memory. In accordance with the present invention, the managing means coordinates the retrieval of data over a cluster with logically shared disks. Note that firmware is computer programming instructions that are stored in a read-only memory unit rather than being implemented through software. Thus, hardware specific code HDM, stored in storage HDMs to manage the SCSI or FCAL interface hardware, is readable as firmware of the HBA).

With regard to claim 14, it is clear that the local bus interface message software driver receives the bus interface message request from the local software application (see discussion regarding claims 12 and 13 above).

With regard to claim 18, Heil discloses a method for managing a remote host bus adapter, comprising: acquiring a Peripheral Component Interconnect (PCI) message

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request (an I/O request from the host 100 transmitted via a PCI interface 115/116.5/200/230 and received by a local host bus adapter 117); encapsulating the PCI message request in a Fibre Channel (FC) packet (the I/O request is then encapsulated in packet and transmitted via Fiber Channel Backbone 121); and transmitting the encapsulated FC packet to a remote host bus adapter (the encapsulated FC packet is transmitted to the remote host bus adapter 126).

With regard to claim 20, it is clear that transmission of the encapsulated FC packet occurs over an FC link or FC Backbone 121.

With regard to claim 21, it is clear that the encapsulated FC packet is used by the local host bus adapter 117 to configure the directory and update directory related to the remote host bus adapter 126.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware.

Heil, as discussed above, discloses the claimed invention. Heil does not disclose modifying a remote host bus adapter management protocol message to include the bus interface message request.

Emulex HBAnyware discloses HBAnyware™ is a centralized HBA management suite that dramatically simplifies SAN management and lowers total cost of ownership. HBAnyware incorporates driver-based technology to enable complete management of Emulex HBAs, including the ability to upgrade firmware anywhere in a Fibre Channel or iSCSI SAN from a single console. HBAnyware leverages Emulex's unique architectural capabilities, including firmware upgradeability and driver compatibility across product generations, to further reduce planned downtime and improve IT management productivity. HBAnyware provides an extensible operating system-independent framework for communication with, and management of, Emulex HBAs. The framework consists of host system resident clients, agents and services, as well as an Emulex defined command set utilizing the industry-standard Fibre Channel General Service Common Transport (FC-GS-3 CT) protocol as an "in-band" transport mechanism. In another word, one can use Emulex HBAnyware defined command to modify the industry-standard Fibre Channel General Service Common Transport (FC-GS-3 CT) protocol message to update firmware and driver compatibility for HBAs to further reduce planned downtime and improve IT management productivity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Emulex HBAnyware in the HBAs of Heil, as taught by Emulex for the purpose of reducing cost, planned downtime, and improving IT

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management productivity. Note that it is clear from Heil and Emulex HBAnyware that the local HBA 117 must determine whether the remote 126 is capable of receiving the message request before the remote host bus adapter is provided with remote host bus adapter management protocol message modified by the Emulex HBAnyware.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of LSI Logic's Fusion-MPT.

Heil, as discussed above, discloses the claimed invention. Heil does not disclose the use of Fusion-MPT. However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT in the host interface architecture of Heil, as

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taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

Claims 1-4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAnyware.

With regard to claims 1-3, Heil discloses a system for remote host bus adapter management, comprising: a local host bus adapter (HBA 117, Fig. 1, for example); a remote host bus adapter (HBA 126, Fig. 1, for example); and switching and routing means (Fiber Channel Backbone 211, Fig. 1, for example) for communicatively coupling the local host bus adapter (HBA 117, Fig. 1, for example) and the remote host bus adapter (HBA 126, Fig. 1, for example), wherein the local host bus adapter is capable of managing the remote host bus adapter through a bus interface (in Heil, it is clear that the local host bus adapter 117 is capable of managing the remote host adapter 126 via interface provided by the FC Backbone 121, Fiber Channel Chips 120/122). Heil does not disclose modifying a remote host bus adapter management protocol message to include the bus interface message request.

Emulex HBAnyware discloses HBAnyware™ is a centralized HBA management suite that dramatically simplifies SAN management and lowers total cost of ownership. HBAnyware incorporates driver-based technology to enable complete management of Emulex HBAs, including the ability to upgrade firmware anywhere in a Fibre Channel or

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iSCSI SAN from a single console. HBAnyware leverages Emulex's unique architectural capabilities, including firmware upgradeability and driver compatibility across product generations, to further reduce planned downtime and improve IT management productivity. HBAnyware provides an extensible operating system-independent framework for communication with, and management of, Emulex HBAs. The framework consists of host system resident clients, agents and services, as well as an Emulex defined command set utilizing the industry-standard Fibre Channel General Service Common Transport (FC-GS-3 CT) protocol as an "in-band" transport mechanism. In another word, one can use Emulex HBAnyware defined command to modify the industry-standard Fibre Channel General Service Common Transport (FC-GS-3 CT) protocol message to update firmware and driver compatibility for HBAs to further reduce planned downtime and improve IT management productivity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Emulex HBAnyware in the HBAs of Heil, as taught by Emulex for the purpose of reducing cost, planned downtime, and improving IT management productivity. Note that it is clear from Heil and Emulex HBAnyware that the local HBA 117 must determine whether the remote 126 is capable of receiving the message request before the remote host bus adapter is provided with remote host bus adapter management protocol message modified by the Emulex HBAnyware. With regard to claim 4, it is clear that HBA management provided by HBAnyware including indentifying bus type, since protocol and driver update is directly related to bus type of

the HBA. With regard to claim 6, it is clear that in Heil, the bus type is Fibre Channel (FC).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of SAS bus for the HBA. However, the use of SAS is old and well-known as evidenced by Emulex SLI Architecture, cited below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ SAS in Heil, since the use of SAS bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting SAS bus in Heil only involves ordinary skill in the art.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of Infiniband bus for the HBA. However, the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage, cited below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Infiniband in Heil, since the use of Infiniband bus is old and well-known as evidenced by Infiniband Storage; and selecting Infiniband bus in Heil only involves ordinary skill in the art.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of iSCSI bus for the HBA. However, the use of iSCSI is old and well-known as evidenced by Emulex SLI Architecture, cited below. It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ iSCSI in Heil, since the use of iSCSI bus is old and well-known as evidenced by Emulex SLI Architecture; and selecting iSCSI bus in Heil only involves ordinary skill in the art.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Heil in view of Emulex HBAniware, as applied to claims 1-4, and 6 above, and further in view of the following.

The further difference between the claimed subject matter and that of Heil is the use of Fusion-MPT. However, the use of Fusion-MPT is old and well-known as evidenced by LSI Logic's Fusion-MPT. Fusion-MPT architecture encompasses LSI Logic's Fusion-MPT firmware architecture, LSI Logic's SCSI hardware architecture, LSI Logic's Fibre Channel hardware architecture, and the operating system level drivers that support these architectures. Fusion-MPT architecture has the unique feature of having a single device driver that supports both Fibre Channel and SCSI. LSI Logic's Fusion-

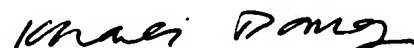
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MPT architecture is designed to support 64-bit architectures with 64-bit PCI and 64-bit PCI-X interfaces for high host side performance. Fusion-MPT architecture is modular and readily extensible to other host interface architectures as they emerge. Fusion-MPT technology delivers higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to employ Fusion-MPT in the host interface architecture of Heil, as taught by LSI Logic's Fusion-MPT, for the purpose of providing the HBA architecture of Heil with higher performance due to outstanding performance hardware components, sophisticated I/O scheduling, and intelligent firmware design.

US Patent Nos. 5,991,813 to Zarrow, 6,584,499 to Jantz et al., 6,480,955 to DeKoning et al., SLI Emulex Architecture, Emulex HBAnyware v. 1.0a8, Infiniband Storage, and Storage Management Enabled with APIs are cited as relevant art.

Any inquiry concerning this communication should be directed to Khanh Dang at telephone number 571-272-3626.



Khanh Dang
Primary Examiner